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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,290	10/15/2001	John Prohaska	081787-11	1049

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EXAMINER

WANG, QUAN ZHEN

ART UNIT PAPER NUMBER

2633

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/976,290	<b>Applicant(s)</b> PROHASKA, JOHN	
	<b>Examiner</b> Quan-Zhen Wang	<b>Art Unit</b> 2633	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 January 1005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2,15 and 16 is/are allowed.
- 6) ☒ Claim(s) 1 and 3-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al. (U.S. Patent US 6,035,080) in view of admitted prior art figs. 4A and 4B and lines 8-27 on page 3 (APA).

Regarding claim 1, Henry teaches a re-configurable wavelength selective device (fig. 6) comprising an input fiber (fig. 6, IN), where a signal comprising multiple wavelengths is brought into the device, a cross-connect switch (fig. 6, 1XN switch 60), two output fibers, one for a selected wavelength  $\lambda_i$  (fig. 6, DROP) and the other for the remaining wavelengths which pass through the device unaffected (fig. 6, OUT). The system of Henry differs from the claimed invention in that Henry does not specifically teach that the cross-connect switch includes a plurality of input fibers and an array of micro-mirror actuators. However, it is well known in the art that an array of micro mirrors can be used for a cross-connect. For example, APA pointed out that "MEMS actuated micro-mirrors offer an inexpensive, versatile way to redirect light beams in optical systems" (page 3, lines 8-9). APA further pointed out that "micro-mirrors may be readily formed into small to large arrays using a wide array micromachining techniques"

(page 3, lines 13-14). APA further pointed out that "MEMS devices have been used ... as wavelength selective switches" (page 3, lines 18-19). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a micro-mirror based cross-connect switch including a plurality of input ports, as it is disclosed by APA, into the system of Henry in order to redirect light beams in an inexpensive, versatile way.

Regarding claims 3-4, Henry further teaches that the system further comprising an optical circulator (fig. 6, circulator 50), and the selected wavelength is output from the optical circulator (fig. 6, DROP).

Regarding claim 5, Henry further teaches that the cross-connect switch further comprises a plurality of output fibers that each includes a fiber Bragg grating (fig. 6, A1 – An).

Regarding claim 6, Henry further teaches that the cross-connect switch comprises an array of output fibers (fig. 6, A1-An). It is inherent that for a micro-mirror based cross-connect switch, a signal received at any of the input port fibers may be output via any one of the outputs.

2. Claims 9-14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. (U.S. Patent US 6,768,822 B1) in view of admitted prior art figs. 4A and 4B and lines 8-27 on page 3 (APA).

Regarding claim 9, Robinson teaches a reconfigurable dispersion compensation device (fig. 1), comprising: an input fiber ( fig. 1, input fiber 7) including a corrupted signal (fig. 1, light in); and a cross-connected switch that receives the corrupted signal

and directs the corrupted signal to one of a plurality dispersion compensation gratings (fig. 1, Q1-Q5) for imparting a compensating dispersion to the corrupted signal (column 3, lines 41-67), and an output (fig. 1, output 8) for providing a compensated signal (fig. 1, light out). The system of Robinson differs from the claimed invention in that Robinson does not specifically teach that the connect switch further comprising an array of micro-mirror actuators. However, it is well known in the art that an array of micro mirrors can be used for a cross-connect. For example, APA pointed out that "MEMS actuated micro-mirrors offer an inexpensive, versatile way to redirect light beams in optical systems" (page 3, lines 8-9). APA further pointed out that "micro-mirrors may be readily formed into small to large arrays using a wide array micromachining techniques" (page 3, lines 13-14). APA further pointed out that "MEMS devices have been used ... as wavelength selective switches" (page 3, lines 18-19). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a micro-mirror based cross-connect switch, as it is disclosed by APA, into the system of Robinson in order to redirect light beams in an inexpensive, versatile way.

Regarding claims 10 and 14, Robinson further teaches that the system further comprising a circulator (fig. 1, circulator 2) for receiving the corrupted signal and for output the compensated signal, and the compensated signal is passed through the circulator and to the output fiber (fig. 1, output fiber 8).

Regarding claim 11-12, Robinson further teaches that the dispersion compensation gratings are fiber Bragg gratings with unique period variations (column3, lines 41-67).

Regarding claim 13, APA further discloses that the micro-mirror actuator further comprises a pair of orthogonal single axis mirror actuator (page 3, lines 8-27).

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al. (U.S. Patent US 6,035,080) in view of admitted prior art figs. 4A and 4B and lines 8-27 on page 3 (APA) and further in view of Fritz et al. (U.S. Patent US 5,446,809).

Regarding claim 7, the modified system of Henry and APA differs from the claimed invention in that Henry and APA do not specifically teach that the system further comprising a fiber optical coupler configured to combined branches output from the cross-connect switch so that unselected wavelength channels exit through the other of the two output fibers. However, it is well known in the art to use a fiber optic coupler to combine a plurality of optical fibers to one output fiber. For example, Fritz teaches an optical coupler (fig. 5) to combine 16 fibers into one output fiber. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a fiber optic coupler, such as the one taught by Fritz, into the modified system of Henry and APA in order to combined the plurality of outputs of the cross-connect switch into one output fiber.

***Allowable Subject Matter***

4. Claims 2, and 15-16 are allowed.

***Response to Amendment***

Applicant's arguments with respect to claims 1, 3-14 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571)

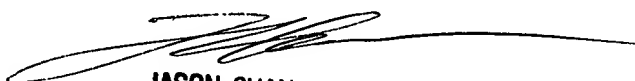
Art Unit: 2633

272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw  
5/15/05



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